Department of Energy
Ohio Field Office
Fernald Area Office
P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155

--2537

OCT 1 1999

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SRF-5J
77 West Jackson Boulevard
Chicago, IL 60604-3590

DOE-1154-99

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, OH 45402-2911

Ms. Val Orr
Division of Drinking and Ground Waters – UIC Unit
P.O. Box 1049
1800 Watermark Drive
Columbus, OH 43216-1049

Dear Mr. Saric, Mr. Schneider, and Ms. Orr:

RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE MARCH AND APRIL 1999 MONTHLY OPERATING REPORTS FOR THE RE-INJECTION DEMONSTRATION

This correspondence submits the subject responses.

If you have any questions regarding this submittal, please contact Kathleen Nickel at (513) 648-3166.

Sincerely,

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Nickel

Enclosure

1

OCT 1 1999

2537

Mr. James A. Saric
Mr. Tom Schneider
Ms. Val Orr

cc w/enclosure:
G. Jablonowski, USEPA-V, SRF-5J
T. Schneider, OEPA – Dayton (three copies of enclosure)
F. Bell, ATSDR
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
F. Barker, Tetra Tech
D. Brettschneider, FDF/52-5
K. Broberg, FDF/52-5
D. Carr, FDF/52-2
W. Hertel, FDF/52-5
R. White, FDF/52-5
AR Coordinator

cc w/o enclosure:
N. Hallein, EM-42/CLOV
A. Tanner, OH/FEMP
T. Hagen, FDF/65-2
J. Harmon, FDF/90
R. Heck, FDF/2
S. Hinnefeld, FDF/31
T. Walsh, FDF/65-2
ECDC, FDF/52-7

2

-- 2537

RESPONSES TO OEPA COMMENTS ON THE MARCH AND APRIL MONTHLY OPERATING REPORTS RE-INJECTION DEMONSTRATION

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

SEPTEMBER 1999

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

3

RESPONSES TO OEPA COMMENTS ON THE MARCH AND APRIL MONTHLY OPERATING REPORTS RE-INJECTION DEMONSTRATION

2537

Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section#: March 1999 Report Pg.#: 2 Line#: 13 Code: C
Original Comment# 1

Comment: Injection water levels in Well 10 have been increasing approximately 10 feet per month as shown by the February and March monthly reports. Based on an original static water level of approximately 525 feet, the ground elevation of 576 feet, and the 50 foot water level increase in Well 10 since injection began (Figure 2), the available freeboard in this well for injection water level increase appears to be used up or nearly so. The text should discuss what actions have been (or will) be taken to address this condition.

Response: The monthly reports have been presenting actions taken (on a well by well basis) to address plugging in the re-injection wells. The purpose of the discussions is to document that the work conducted was protective of the aquifer. Rehabilitation of Re-Injection Well 10 took place in April, and a discussion of the work is provided in the April report. Before rehabilitation the water level in the well was 51.79 feet. Following rehabilitation the water level in the well was 8.54 feet.

Action: No action required.

Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section#: March 1999 Report Pg.#: 3 Line#: 9 Code: C
Original Comment# 2

Comment: As stated in the text, the water level increase after the first (late October) rehabilitation of Well 8 was 4.02 feet, which is comparable to the initial increase of 5.34 feet observed when injection was first started. The increase of 7.48 feet after the most recent treatment seems high. Does the higher increase indicate a decline in the overall performance of this well?

Response: DOE is also concerned that the initial water level rise after the second treatment was higher than the initial water level rise after the first treatment. The increase might be the result of residual plugging and may indicate a decline in the overall performance of the well. The increase though could be caused by seasonal influences. Paddys Run is located just up-gradient of the well. Seasonal recharge conditions around Paddys Run could influence seasonal growth patterns in the iron bacteria causing the plugging. During certain periods of the year, the rehabilitation may need to be conducted more aggressively to get the same effect that can be achieved at other times of year when it is conducted less aggressively. DOE would like to operate the well for a year before adjusting re-habilitation procedures. If the initial water level following subsequent rehabilitations continues to increase then a more aggressive re-habilitation (i.e., additional chlorine, stronger surging, more pumping etc.) might be conducted in an attempt to bring the initial water level back down.

Action: As stated in response.

Commenting Organization: OEPA Commentor: HSI GeoTrans, Inc.
Section#: April 1999 Report Pg.#: 3 Line#: 3 Code: C
Original Comment# 3

Comment: The text indicates that when Re-Injection Well 10 was returned to service after rehabilitation, the water level rise in the well was 8.54 feet. This is a 74 percent increase over the initial water level rise of 4.92 feet recorded in the well when

4

re-injection began in September, 1998. As noted in the April 1998 progress report, initial injection pressures after the two rehabilitation events at Re-Injection Well 8 increased 33 and 86 percent respectively, over startup levels. It is clear from previous site experience and the marked improvements in the well performance following treatment that biofouling is the primary cause for the buildup of excessive injection pressures. A secondary but potentially significant cause, however, is potential plugging resulting from the solids contained in the injectate. Driscoll (1986) discusses injection well case studies where excessive pressure buildup from sand plugging resulted from injectate sand contents of 3.3 mg/L and 0.004 mg/L. According to the "Operations and Maintenance Master Plan for the Aquifer Restoration and Wastewater Project," the treatment applied to the water prior to re-injection includes aeration, granular multimedia filtration, and ion exchange. What is the solids content of the AWWT effluent that is destined for re-injection? What is the potential that the observed, apparently irreversible performance deterioration at Injection Wells 8 and 10 result from sand plugging? Are the AWWT injectate solids levels appropriate for long term implementation of the re-injection remedial strategy?

Response: Total suspended solids (TSS) concentration data collected from the injectate indicates that plugging due to total suspended solids is a minor concern when compared to plugging caused by biological growth. Composite TSS samples for the past 12 months indicate that the TSS content of the injectate is < 1 mg/L. DOE is aware that over the long term, even this low TSS concentration can cause some plugging around the re-injection well screen. Given though the unconsolidated nature of the aquifer, low re-injection rates, and low TSS concentrations, DOE expects that long term plugging due to TSS will be minimal.

As presented in the South Field Injection Test Report (DOE 1995) plugging processes include not only biological growth and deposition of total suspended solids, but also: entrained air and gas binding, particle rearrangement in the aquifer material adjacent to the injection well, and geochemical reactions. All of these potential plugging processes are being considered.

Action: No action required.

Commenting Organization: OEPA Commentor: OFFO
Section#: April 1999 Report Pg.#: 1 Line#: Code: C
Original Comment# 4

Comment: The lead concentrations reported for the April injectate sample is not only above the FRL but also above the Safe Drinking Water action level. We agree that the concentration is anomalously high compared to general water quality in the GMA. Our first reaction would also have been to check with the laboratory. On being informed that the lab was standing firm in the original analysis, we would have immediately grabbed another sample. We would have used the (hopefully) low re-sample results to defend ourselves against the contention that we had injected water above drinking water standards for the entire month. We also expect that the May results will be more in line with expectations.

Response: The suggested sequence of events outlined above did occur. The lab verified the analytical result. By the time analytical results were received from the contract lab for the April sample, it was time to collect the May sample, so another sample was collected in a timely manner. As reported in the May Re-Injection Monthly Operating Report the lead concentration was back down below the FRL for lead.

Action: No action required.

5